

REMARKS

Claims 11 and 13-23 are pending. Claims 12 and 56-70 are temporarily withdrawn as being directed to a non-elected species, but pursuant to PTO rules will automatically re-enter the application should generic claims be allowed.

I. Rejections Over the Prior Art:

In responding to the Examiner's prior art rejections, Applicant here only justifies the patentability of the pending independent claims (i.e., claim 11). As the Examiner will appreciate, should independent claim 11 be patentable over the prior art, narrower dependent claims would also necessarily be patentable. Accordingly, Applicant does not separately discuss the patentability of the dependent claims, although it reserves the right to do so at a later time if necessary.

Claim 11 has been rejected as obvious (35 U.S.C. § 103) by USP 6,538,734 ("Powell") individually, or Powell in combination with USP 6,007,671 ("Fujimura").

Powell:

Powell only discloses introduction of a reference gas into Powell's processing chamber (reaction chamber 101). Powell does not disclose introducing the reference gas only into Powell's plasma chamber (excitation chamber 105). The Applicant and the Examiner seem to agree on these points, and the Applicant has in no way mischaracterized Powell by pointing this out.¹ In short, Powell does not disclose that "the reference gas does not pass through the processing chamber," as recited in claim 11.

¹ Applicant never made the point that the reference gas in Powell "must" flow through Powell's processing chamber. Applicant merely only pointed out what Powell discloses and doesn't disclose regarding porting the reference gas.

However, the Examiner contends that it would have been obvious to one of ordinary skill in the art to have modified Powell's disclosure to port the reference gas into only the plasma chamber, thus meeting the above-quoted limitation. Specifically, the Examiner states that:

"[h]aving a dedicated input for [the] reference gas [on the plasma chamber] has the obvious advantage that a self contained unit with a dedicated port could be designed for any number or types of references gases and could be attached to any process chamber without any modification to it, since on a process chamber, gas inlet ports would generally be specific to a certain process."

Office Action at 3-4.

However, in making this observation, the Examiner seems to have impermissibly used the hindsight of Applicant's disclosure, for Applicant's disclosure makes this very same point:

"[T]he incorporation of actinometry . . . into the improved ICP chamber 50 has significant benefits. First, modification to the processing chamber 10 is not necessary, reducing potential sources of contamination and necessary maintenance of the chamber 10."

Applicant's Specification at para. [0033].

The Examiner further states that Powell could have been easily modified by one skilled in the art to provide a reference gas to the plasma chamber instead of the processing chamber because "there is no appreciation in [Applicant's] specification that [where to port the reference gas] is anything more than a mere plumbing convenience." Office Action at 6-7. This is absolutely not true: Applicant's specification specifically criticizes the introduction of actinometry reference gases directly into the processing chamber. See Applicant's specification at paras. [0010] and [0011]. And, Applicant's specification touts the advantages of introducing the reference gases into the plasma chamber:

"[T]he incorporation of actinometry . . . into the improved ICP chamber 50 has significant benefits. First, modification to the processing chamber 10 is not necessary, reducing potential sources of contamination and necessary maintenance of the chamber 10. Second, the ICP chamber allows for the analysis of gases used in the processing chamber 10 even when those gases are not ionized

(e.g., CVD deposition). Additionally, there is no need to introduce actinometry reference gases or probes into the process chamber, which removes factors from the processing chamber which could adversely affect the sensitive processes being run therein.

Applicant's Specification at para. [0033]. It is therefore not correct that the specifically-claimed limitations regarding the porting of the reference gas were unappreciated by the Applicant, or that such limitations are insignificant details. Indeed, such details were specifically touted in the specification as an inventive advantage for several reasons.

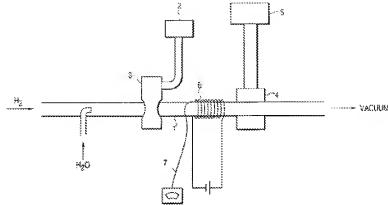
Applicant hopes that if the Examiner will once again consider Applicant's specification, he will see that his reasoning for the rejection of Applicant's claims really comprises only the hindsight use of Applicant's own teachings, and that the evidence shows that the claimed invention amounts to more than a mere "plumbing convenience." In short, Applicant hopes he has finally convinced the Examiner that the claims are not obvious in light of Powell.

Fujimura:

Fujimura also does not disclose that "the reference gas does not pass through the processing chamber," as recited in claim 11.

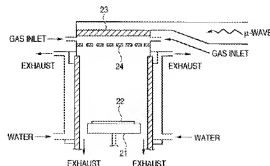
The examiner considers the water vapor (H_2O) in Fujimura's hydrogen [H_2] plasma down-flow processing method to comprise a reference gas. By "down flow," it is meant a plasma process in which a workpiece is positioned in the down-stream flow of the plasma. See Fujimura, col. 3, ll. 38-39 (noting that the "processing object [i.e., the workpiece] is processed on the down-flow side of the plasma."). Thus, and referring to Figure 1, reproduced below, the workpiece being processed in Fujimura would appear on the right side ("vacuum") of that drawing, and hence the water vapor would flow to the processing chamber.

FIG. 1



The Examiner states that “[t]he reference gas is not disclosed passing through any process chamber.” Office Action at 5-6. This is not correct. As just pointed out, the “processing object [i.e., the workpiece] is processed on the down-flow side of the plasma” which contains the water. Applicant has explained this before, but does so now with what is hopefully an easier-to-understand embodiment of Fujimura, namely that illustrated in Figure 5. Figure 5 illustrates a hydrogen plasma down-flow processing apparatus for wafer processing. Col. 10, ll. 6-8. The wafer is shown as 22 in Figure 5 below. Also shown are the “gas inlet” ports which carry “a mixed gas of hydrogen of 475 cc/min and H₂O of 25 cc/min.” Col. 10, ll. 12-14. Therefore, clearly what the Examiner considers to be the reference gas—H₂O or water vapor—flows in the same processing chamber that holds the work piece.

FIG. 5



When this is appreciated, Fujimura clearly does not disclose the limitation in claim 11 that “the reference gas does not pass through the processing chamber.” Moreover, as pointed out earlier, Powell likewise does not disclose this limitation. Therefore, even if these two references are taken together in combination, they both fail to disclose the same claim limitation and therefore cannot render claim 11 obvious. See MPEP § 2143.03.

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Based on the above remarks, Applicant respectfully submits that the pending claims are allowable, and requests that a Notice of Allowance issue for these claims and for all claims that currently stand as withdrawn.

Respectfully submitted,

/ TGL /

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